

## I. DEFINITION AND CLASSIFICATION

### A. Definition of Diabetes Mellitus

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels.

Several pathogenic processes are involved in the development of diabetes. These range from autoimmune destruction of the  $\beta$ -cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. Impairment of insulin secretion and defects in insulin action frequently coexist in the same patient, and it is often unclear which abnormality, if either alone, is the primary cause of the hyperglycemia.

### B. Classification of Diabetes Mellitus

Patients with any form of diabetes may require insulin treatment at some stage of their disease. Such use of insulin does not, of itself, classify the patient.

#### 1. Type 1 diabetes

Type 1 diabetes results from  $\beta$ -cell destruction, usually leading to absolute insulin deficiency. It occurs in all ages, with the highest incidence in ten- to fourteen-year-old youth world-wide.

##### Immune mediated:

1. Type 1 diabetes is due to pancreatic islet  $\beta$ -cell destruction, predominantly by an autoimmune process associated by human lymphocyte antigens and genetic factors. Insulin secretory capacity then gradually declines until it is totally lost. Approximately 90% of cases of type 1 diabetes are immune-mediated.
2. In adult onset type 1 diabetes, also known as latent autoimmune diabetes of adulthood (LADA), human lymphocyte antigens types may be different from those of juvenile-onset type 1 diabetes, and islet-directed antibody titers may be lower. Approximately 20% of patients diagnosed with type 2 diabetes may actually have LADA.

##### Idiopathic:

Other factors contribute to the development of type 1 diabetes in some patients. No evidence of pancreatic  $\beta$ -cell autoimmunity is found to explain their insulinopenia or ketoacidosis.

#### 2. Type 2 diabetes

Defects of type 2 diabetes may range from predominantly insulin resistance to a predominantly secretory defect with insulin resistance.

### C. Other Specific Types & Causes

#### A. Genetic defects of $\beta$ -cell function

1. Chromosome 12, HNF-1 (MODY3)
2. Chromosome 7, glucokinase (MODY2)
3. Chromosome 20, HNF-4 (MODY1)
4. Mitochondrial DNA
5. Others

#### B. Genetic defects in insulin action

1. Type A insulin resistance
2. Leprechaunism
3. Rabson-Mendenhall syndrome
4. Lipotrophic diabetes
5. Others

**C. Diseases of the exocrine pancreas**

1. Pancreatitis
2. Trauma/pancreatectomy
3. Neoplasia
4. Cystic fibrosis
5. Hemochromatosis
6. Fibrocalculous pancreatopathy
7. Others

**D. Endocrinopathies**

1. Acromegaly
2. Cushing's syndrome
3. Glucagonoma
4. Pheochromocytoma
5. Hyperthyroidism
6. Somatostatinoma
7. Aldosteronoma
8. Others

**E. Drug- or chemical-induced**

1. Glucocorticoids
2. Atypical antipsychotics
3. Vacor
4. Pentamidine
5. Nicotinic acid
6. Thyroid hormone
7. Diazoxide
8.  $\beta$ -adrenergic agonists
9. Thiazides
10. Dilantin
11. Interferon
12. Others

**F. Infections**

1. Congenital rubella
2. Cytomegalovirus
3. Others

**G. Uncommon forms of immune-mediated diabetes**

1. "Stiff-man" syndrome
2. Anti-insulin receptor antibodies
3. Others

**H. Other genetic syndromes sometimes associated with diabetes**

1. Down's syndrome
2. Klinefelter's syndrome
3. Turner's syndrome
4. Wolfram's syndrome
5. Friedreich's ataxia
6. Huntington's chorea
7. Laurence-Moon-Biedl syndrome
8. Myotonic dystrophy
9. Porphyria
10. Prader-Willi syndrome
11. Others

**D. Gestational Diabetes Mellitus (GDM)****Definition**

GDM is any degree of glucose intolerance with onset or first recognition during pregnancy. This does not exclude the possibility that the glucose intolerance occurred prior to conception. Six weeks after the pregnancy ends the woman should be reclassified into one of the following categories:

1) diabetes, 2) pre-diabetes, or 3) normoglycemia.

**REFERENCE SECTION I**

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